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Professor O’Connor 10/14/16

Action research has two goals, one is to stimulate learning and the other to make a difference. This is achieved by posing questions, planning, gathering data, reflecting, and capturing. Action research is a process that first begins with a problem that is complex. A researcher then plans to solve this problem by creating solutions. These solutions take gathering information, experimenting, collecting data and reporting the findings. Reflect on those findings by asking what happened, why it happened and what could be done differently. Finally capture your findings to share with others so they can learn from your work.

The Problem-

The current educational issue that I want to research is why elementary students entering middle school struggle with Common Core Math: algebra, geometry, number systems, ratios, and statistics? What interventions are needed to bridge the gap between elementary and middle school math?

Prior Knowledge

I chose this topic because over the past 10 year teaching both elementary and middle school math I have seen many students have serious issues with understanding particular math concepts. When New York shifted to Common Core standards I noticed that the number of students proficient in math decreased. In 2015 test results on the NYS math exam had a slight increase of 35% of students in the city being proficient. I’ve also used a variety of math aligned materials such as Big Ideas Math: A Common Core Curriculum and Ready New York CCLS which has led to success in my classroom. But I often wonder what materials are being used in previous grades because many of my students enter my class below grade level. There must be a reason why many elementary students are entering middle school below grade level in math. Some of the reason why students are having issues in math are because they do not understand the four functions/ operations and how they are connected. I also think most of them have poor reading and concentration skills which usually leads to behavior issues as well. I do think there is a possibility that many of these students had teachers who are not properly trained with the new standards and they really did not understand how to teach math in an effective way.

<http://www.nytimes.com/2015/08/13/nyregion/new-york-state-students-standardized-tests.html>

The issue is researchable. One source of data is the New York State Test Results that show a dip in scores from elementary to middle school students. Common Core math asks students to explain the math and be able to apply it to real life situations. They need to have the strategies to answer the question in multiply ways. Many times student are unable to add, subtract, multiply and divide multi-digit numbers correctly due to their poor understanding of the number system. Elementary students need to understand the relationship between numbers prior to entering middle school. In middle school math word problems are prevalent, so students must be able to read and identify key terms, words and phrases in order to perform the correct operations.

<http://www.nytimes.com/interactive/2015/08/12/nyregion/13new-york-state-test-results.html>

Pros and Cons:

There are so many approaches to teaching math and providing interventions for students who struggle which can be both a pro and a con. The question is what instructional strategies can be applied that have been proven to work. One question that was posed by a journal I read was if students should focus on calculation or word problems to increase algebraic knowledge. In one approach students will increase their understanding of the number system by practicing their multiplication 2-12. The other approach would have students identifying key terms to solve word problems and apply the correct operations. Teaching students math terminology to better grasp the grade level mathematical concepts. Finding the right approach to bridging the gap will increase proficiency on assessments like the NYS exam.

“Does Calculation or Word-Problem Instruction Provide a Stronger Route to Prealgebraic Knowledge?,” by Lynn Fuchs et al., Journal of Educational Psychology, 2014, Volume 106, Number 4, pp. 990-1006.

What interventions are needed to bridge the gap between elementary and middle school math?

Students learn by discovery and cooperative learning groups. It is proven that students grow when learning from one another. I plan on using inquiry based learning alongside the common core standards. First I would need to administer a diagnostic math exam on 6th grade standards as a baseline for data on where student levels are. A majority of the time elementary students entering middle student struggle with the four functions and word problem. Understanding the 4 operations are the pillars of mathematic. I plan to teach students the following skills:

* place values of whole numbers and decimals
* Explain and model how to add and subtract whole numbers and decimals.
* Followed by explaining and model how multiplication is repeated addition. I would teach students how to multiply by filling out the multiplication chart from 1 thru 12 and then model how to multiply single digit numbers by multi – digit numbers.
* Followed by how to multiply multi – digit numbers by multi – digit numbers.
* Explain and model how division is repeated subtraction. I would model to students how to divide single digits into multi – digit number.
* The last aspect of the 4 operations is teaching students how to complete long division, dividing multi – digit numbers by multi – digit numbers.
* Students will have a better understanding of the 4 operations and the number system by these instructions and practices.

For students to be successful in middle school math they must understand and be able to perform the 4 operations. I would continue by teaching word problems by modeling how to determine which operations to perform by identifying key words/ terms. Identify key words, terms and phrases are essential to success in elementary and middle school mathematics. Daily exit tickets will be used to measure student growth on each function taught. Exit tickets will consist of 3-5 questions based on the lesson. Then students will also receive an assessment at the end of each unit. These two assessments, the daily exit ticket and unit test, can serve as a way to track data and measure growth.

Secada, W. (1995). Social and critical dimensions for equity in mathematics education. In

W. Secada, E. Fennema, & L. Byrd Adajian (Eds.), *New directions for equity in*

*mathematics education* (pp. 147-164). Cambridge: Cambridge University Press.